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PUSH
BOX 4

1

Lectures on Physiology.

began Nov. 25th 1791.

of animal life — p. 15.

of external and internal Stimuli } 19.

1 External
Light — 19
Sound — 23
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2 Internal Stimuli 32.
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Gentlemen/

In entering upon the ~~p~~ duties of our Theological course I feel as a ~~-~~ if I were about to enter into the temple of ~~the~~ the Deity. The human body contains so many marks of inimitable power - wisdom and goodness in its construction that it would be an act of impiety to enter upon the considerations of its ~~structure and~~ functions without doing homage to its divine architect. It was formed after a divine consultation in the councils of heaven. It was created in the divine image. ~~It was~~

The world and all its furniture (man
excepted) ~~was~~ rose into existance at the
single
~~word of~~ command of the great Creator.
But ~~was not~~ this was not the case with the
body of man. It was formed after a divine
consultation in ~~the council~~ of heaven.
The Creator of the Universe descends from
his throne, to choose and modify the clay
with his own hands
~~with~~ from which the first man was
formed. ~~The~~ person of his Son is suppo=
=sed to be the perfect model from which
the body of man was copied. He imparted to him
the breath of ~~the~~ exact likeness ~~to~~ of the
first pulse to life. ~~and the voice~~
~~was~~ ~~of~~ his

Nor did the ceremony of his creation
end here. — for it was not till man
was formed, that the Creator ~~rested~~
~~Creator was established with the~~

V In approaching ~~contemplating~~ this masterpiece of
divine workmanship, we are first struck
with its erect form. In this particular
he is distinguished from every other animal
upon the Globe. Nor is this, acquired by any
of improvement in the exercise of his rea-
-soning faculties as some modern infidels
have supposed. His first movements
~~walk upon two feet, is precisely the same upon~~
two feet. The shape, of his face - the position
of his eyes - the form, of the Vertebrae, - the
length of his thighs and legs to the arms,
- the elevation of his hips above his shoul-
- ders when he attempts to walk like a
Quadruped, & the shape of his hands, - and of
his feet, all indicate that he was made to
walk exclusively upon his feet, & prove that
his first movements in paradise were upon them.
The next thing that strikes us in

surveyed the workmanship of his hands, and with complacency, pronounced them to be ~~that it was~~ very good!! —

Revelation had taught us no more of the dignity & excellency of the human body than is recorded in the Jewish Legislator, it would be sufficient to recommend the examination of its structure & uses to all its parts to our admiration, - But this body has been subjected to death, yet that it must submit to death, yet that

viewing the human body is the symetry
~~and just~~ or just proportions of ~~his~~ all the
parts which compose it to each other.
—a We cease to admire them only be=
=cause they are so familiar to us. To the
eye of a Critic, the beauty of form is in
the human figure is a constant Source of
pleasure. It was remarkably so to
the celebrated Hogarth who has left it
upon record in his treatise upon the line
of beauty, that man is the most
beautiful Creature upon the face of the
earth. It is true there are frequent deviations
from Symetry and beauty in the figures of
men and women in every part of the world,
and in some Countries more than in
others. From five feet to 6 feet
feet 10 inches are suppo=
=sed to constitute the most agreeable height.
The Arms when extended, equalling

of all the elements & atoms of which
it is composed, after ~~undergoing~~ repairing with
~~its~~ their native dust for years or ages, shall
again be reunited, ~~and reanimated~~ That its deposited
life shall be restored - and that it shall
live again in health and beauty - and
continue to be the Object of admiration
and praise to all intelligent beings
as long as God himself shall exist.

In contemplating the human
body in this light the subject of our
Physiological Lectures rises into the
highest degrees of importance. We
are about to begin a study, which
~~and~~ ~~learn~~ ~~of the first book of Creation.~~
and will not end in time, but
which may perhaps furnish employment for

the height of the body - the diameter of the body around the lower parts of the breast ~~spreading~~ and a line from the pubis to the heel spreading half the height the body, are supposed to constitute perfection in the proportions of the different parts of the body to each other. ——

But what is the exact form — and what is the symmetry of the body and its limbs, — compared with "the human face divine" to use the words of Milton? In this Man discovers ~~claims~~ his preminence over all other animal, & to this "chiefly he owes his dominion over them. For the dignity - beauty, and commanding aspect of his face - he is indebted to the mind, which pervades ~~it entire~~ every part, and which is an essential part of his nature.)

But what is this all - that entitles this human body to our notice & admiration? — If it were - ~~a statue of brass or marble~~, it would be but a little elevated

Your intellects, millions of ages hence. ~~in~~ after ~~many births~~ Dr Cheyne has called man an infinitesimal part of God. In the view I have taken of the human body, this account of it may be just. ~~The~~ It is possible, ~~it~~ man may continue to be an unfolding series of mysteries to himself, as long as he exists. ~~to eternity~~. ~~I~~ I am so satisfied with the profound & inexhaustable riches ~~to~~ of knowledge that are contained in the human body, that I think it probable that a single bone of the ear or a single humor of the eye - or the single particle of blood, may furnish materials for investigation - discovery and Admiration to all eternity. ~~throughout~~

go on to p: 7

In entering upon this Subject sent. I am sure you will pardon me, while ~~I am~~ ~~about to~~ ~~publickly~~

above a Statue of brass or marble. But with
the exact form - the just proportions of parts - and
with its beautiful face, - it possesses locomotive
powers - it moves from place to place - apparently
without an impulse; & it feels - of course it
possesses Animal life - but it does more, it
perceives, - it judges, - it reasons, - or in a
words it thinks - Of course it possesses human
life - that is - the a living thinking principle
called mind united in a human body. On
this life the presence of this Animal & rational
life, depend all the functions of the body, and
the operations of the mind. It becomes us then
- fore to begin our physiological inquiries by
first inquiring into the cause of the phenomena
of life. The subject is highly important
subject, and will not only lead to the explanation
of many of the functions of the body & mind but
to a discovery of the cause & cure of most
of the diseases of the human body that are
under the power of medicine.

Begin with p 375 =

~~to declare that any hopes of success in~~
~~the difficult undertaking before me are~~
~~founded chiefly from that hope that~~ I
express a devout wish that, that
divine Being who inspired the builders
of Solomon's temple with a mechani-
=cal Spirit - who taught the fingers
of David the art of war - and who
in all ages and countries has manifested
~~concern knowledge to the simple~~
his Sovereign goodness by imparting
knowledge to the simple - will
guide me ~~thro'~~ the labyrynth that
is before me, and enable me so to
discharge the task I have undertaken,
that no one mistake may fall from
me that shall ever lead to the least
injury of any of his creatures,
but as far as possible to their health

V The Order I have chosen is
different from any that is to be met with
books. You will find it in a Syllabus
which I have published at Wm B Bo ohstore
— The It embraces as you will see
several subjects not commonly intro=
=duced into a Course of Physiology —
particularly the faculties & operations of
the mind. These will lead us occasionally
to discuss ~~moral~~ — metaphysical moral
& even this logical ~~metaphysical~~ subjects. ~~All~~ However
~~thorny~~ these Questions may be; we must
approach & handle them, for they are
intimately & necessarily connected with
the functions & laws of the animal
Perhaps it is because
Economy. ~~That is one reason~~ Do

comfort and happiness. 7

My first object in contemplating the subject of these lectures was to find out a natural & agreeable Order in the arrangement of Dr Haller - Dr Cullen - Dr Gregory - and Dr Duncan appears in many instances to be wholly artificial. Some of them begin with an inquiry into the chemical properties of animal matters - others begin with the dead body, and consider its functions in the order in which they are unfolded by the Anatomical knife, - while One of them begins with the fluids as if they occupied the first rank, or in the body, or obtruded themselves first upon the eye, & Observation of a Physiologist.

Physicians have hitherto been so
of these subjects overawed by the opinions
ignorant, or so ~~timid~~ in deciding
of the Christian Churches
upon them, that Physiology & medicine &
have ~~not~~ so long been obscure,
= Conjectural sciences. — go to p. 11.

[For a while I felt myself embarrassed by the arrangements which I have all mentioned, for could I ~~disengage~~ deliver myself from them ~~prejudices~~ till I suspended for a while all that I had known concerning them, and after inspiring myself for a few minutes a tenant of another Globe, or a being of another Species, I suddenly started upon my Subject, and acted upon what I conceive to be a natural order in treating upon the functions ~~and~~ of the human body. — The first thing that occured to me was the exact form — the motion — and the heat of the human body — or in other words animal life. Upon approaching this

beautiful & striking figure - I perceived it: it possessed certain avenues of knowledge called senses - ~~upon~~ I found upon inquiry that he possessed intelligence - and speech - which distinguished him in an eminent degree from all the animals that surrounded him, — amazed at what I ~~had~~ saw! I began to converse with him, and inquired into the history of his origin - his means of subsistence - and the exact causes upon which his life - ~~and~~ actions both of body and mind depended. He obeyed my inquiry, and gave me an account of every thing he knew with respect to himself. I did not inquire whether he obtained his knowledge by revelation or from the dissection of the living bodies of brutes, or ~~from~~ of the dead bodies

of creatures of his own species, but his
information as far as he knew was
satisfactory — I imagine that
motion of life ~~was~~ told me that the first
of God, but that it had ever since been kept
been kept up by the action of certain
bodies called Stimuli upon it — that
After having obtained as much information
tion from the living subject of our
physiological inquiries as was possible,
I proceeded next in my inspiration
to examine the structure of the dead
internal
body, by means of dissection, —
maceration — and microscopical
observations. To the knowledge
obtained in this way, I added all
that I could collect from experiments

This will lead me to treat of the
nature of the system
for these lectures
V The Order I have chosen I conceive
to be perfectly natural for the first thing that strikes us, in cons
=templating the human body is its life. Go to p: 15 V
~~In treating upon this subject~~ This
important subject you will find discussed
in 3 lectures which I have published
in compliance with the request of my pupils

made upon brute animals in their
living State. Having ~~this~~ finished this
business, I felt my curiosity excited to
know what ~~was~~ ~~the component parts~~
~~of the different~~ parts ~~constituted~~ the nature of
that matter which composed the
human body, and this I formed
discovered by means of a natural
& chemical analysis of the animal
Solids and fluids. — Agreeably to
this impression upon my mind I
shall proceed in the following order
V.
I. I shall inquire into the cause
of animal life. — Under this
head I shall consider ~~the~~ its
different degrees as exemplified in

V I shall next proceed to treat of Animal Heat - of Respiration - and ~~of~~ all the ~~Other Physiological Questions contained in the Syllabus~~ as nearly as possible according to the Order in which they are arranged in our Syllabus. —

last year. Permit me gentlemen to recommend them to your immediate & attentive perusal. They contain the foundation of all the principles of medicine which will

~~V~~ Under this head, I shall treat of the faculties of the Mind. —

be delivered during our present Course. I shall often refer to them, & frequently apply them to the subjects which are before us. — ~~I do not fear~~ I have believed the Doctrines contained in them to be true above 30 years, but the candid reception they have met with the public, and the assent which they obtained from many respectable & unprejudiced Physicians

the sleeping ~~& waking~~ state, and its different Stages, as exemplified in the foetal - infant - youthful - middle - & declining states of life, as also in the states of life in different States of Society - diff^t Climates & diff^t animals.

2. I shall ~~consider~~ inquire into the causes of animal heat. as well as into the nature and laws of the nervous system. as a

4th means of life, I shall consider sensation as extended over the whole body, and subdivided into seeing - hearing - smelling - tasting - & the sense of touch. as a

5 means I shall consider the nature of aliment - digestion & assimilation

6 I shall consider the circulation

have served to confirm me in my belief of them. ~~Passing by thereby upon the present~~ subject Taking it for granted therefore that you admit ^ life

~~to be the effect~~

~~when I have treated of~~

~~To classify~~ ~~Entering~~ upon of those

which belong to ~~our~~ the species gene-

rally. I shall speak of those peculiarities

in the female constitution in which

it differs from the male - & lastly

deliver some observations upon

Generation. I shall say nothing as

to the decay & dissolution of the body in

old age, or death in my system of

Physiology, - for this belongs altogether

to the Pathology. -

~~of~~ in which I include (not above mentioned

I thought) to be the effect of impressions

made upon the body, ~~and lastly~~ I shall

proceed to the next subject mentioned in our

Syllabus viz animal heat go to No 3. p. 134. X

of the blood - Respiration & Secretion.

- 7 I shall consider the exercises -

& I shall inquire into the nature &

uses of the Lymphatic System.

8 - Nutrition. -

9 - Having finished these subjects

I shall inquire into the Spontaneous

& chemical analysis of all the fluids &

solids of y^r body.

You must easily perceive how necessary

some knowledge in Anatomy is presup-

posed in each of these inquiries. It

would require digressions to describe the

structure of every part whose functions

are to be considered, that would destroy

the Order I have laid down, and

render them perhaps less intelligible

& agreeable. Besides you will

V I need not tell you that this is a most important Subject - for the end of all the Studies & busineſs of a Physician is to preserve Life, & to restore it, when suspended, - and this cannot be done perfection untill ~~to advantage~~ we know perfectly in what Life consists.

By animal life as applied to the human species I understand - Sensation - motion & thought - all of which are to be Subjects of present inquiries. The three when united compose perfect life - but there may be life without thought, or even sensation. It is in its most imperfect state when it consists simply of motion. a heat

receive anatomical instruction from another Chair under a thousand advantages above ~~to~~ + I am able to give you. — conducting
In ~~considering~~ this ~~prejudice~~ prejudices of Animal Life. V I shall first assume it as a fact, that every part of the human body possess Sensibility, or irritability, or both of them. By Sensibility I mean a power of ~~sensation~~ having sensation excited from the action of impressions.
" By Irritability I mean that property in the human body which is capable of having motion excited in it by the action of impressions. This property has been called contractility - mobility ~~excitability~~ Stimulability & Excitability.
2ly I assume as a fact that the ~~those things being granted~~,

formed &
Whole human body is ~~one~~ so con-
in the healthy state
=nected that impressions made upon
One part excite sensation, or motion
or both, in every other part of
the body. From this view of it, it
~~This capacity of receiving~~
~~appears to be~~
~~Sensation & motion is The body~~
is an Unit, - One and indivisible.
Its capacity of receiving sensation &
motion is

V

~~Ow to Observe, that the Sensibility, and~~
~~Stimulabibility of the body~~ is variously
extended and modified by means of w:
are called the Senses. These are y avenues
of entrin external impressions which
act upon those parts of the body which
are the Subjects of motion. But the Sen:
=sibility of the body is not confined to its
external Surface, nor is motion ex:
=cited only by external impression.
There are certain impressions com:
=municated by causes which act upon
the internal parts of the body, & which
are essential to its ~~essential~~ healthy
state; Each of which shall be mentioned
in Order. ——

~~Life then is supposed to be found~~ "a

3ly I proved ~~positive~~ to add that life de-
pends upon the action ~~upon~~ of certain
stimuli upon the Sensibility, and
~~Stimulants~~ Contractility which are
in diff.t degrees external & internal &
thus extended over every ~~part~~ part
of the body. These stimuli are as
necessary to its existence & preservation,
as Air is to flame. — It is to use y.r words of D.r Brown
"a forced
state". This I say the words of D.r Brown,
for it was the opinion was first
taught by D.r Cullen in the ~~year~~
1766, and ~~has~~ delivered & detailed by me
in this School ~~since~~ above twenty years ago.
~~published it, yet this opinion~~

It is true D.r Cullen afterwards deserted
the opinion, but it is equally true
I never did, and the belief of it

Opinion
Consonant to this Dr Cullen expresses
himself in one of his clinical
lectures delivered in the same year
in the following words "a living
Animal System is a tremulous
mass of matter" Med. Journal:

"whether the stimulability,
or Excitability of the System be a
Quality of animal matter, or a
Substance as Dr Gisbanus supposes,
is a matter of little Consequence to
our present inquiries. The latter
Opinion has always appeared to me
to be the most probable.

been
has the foundation of every opinion
and modes of practice in medicine which
I have since adopted. If it were supposed
I could produce the notes of a lecture
are
composed in the year 1771 in which I
copied from Dr Cullen's Institu=
tions
the following words, "The human body
is not an Automaton - or self moving
machine - but is kept alive & in motion
by the constant Action of Stimuli
upon it." +

Yes - Viz: the action of y^e brain
- the contraction of every muscular
fibre - the Diastole & Systole of y^e
heart, - the pulsation of the arteries, -
the peristaltic motion of y^e bowels, -
the absorbing power of y^e lymphatics -
- Secretion & excretion - hearing -

V all of which arrange them=
=selves Under two heads. Viz: Desire
& Aversion. The former inclose
hope, love, joy, Ambition - ~~joy~~ and
Avarice - the latter, anger, fear,
hatred, malice, envy & the like.
of each of which I shall treat
in Order.

seeing - smelling - tasting - & the sense of touch may more - strictly all depend upon the action of stimulia upon organs of sense & emotion.

These stimuli are external - and internal. The external are - light - sound - odours - caustics - heat and pure air & the reflected rays of exercise.

The internal stimuli are food - drinks - chyle - the blood - a certain tension of the glands which contain secreted liquors. - the reflected exercises of the understanding & of emotions & passions of the mind. Such as curiosity ambition hope - love - joy - anger - aversion - hatred - avarice - & emulation &c &c of each of which I shall treat in order in which I have mentioned them.

1 Of the external stimuli. The first of these is light. It is unnecessable

that ~~the first man~~ was not brought into
existence Untill ~~the~~ all the Luminaries
of heaven were created. ^Therefore The awakened
in a flare of light — nor was he in-
-sensible of ~~a~~ its efficacy upon his
System owning to the sublime ideas of
Milton upon this Subject. — Light it
has been demonstrated consists of
particles of matter. ^is excited Its action is felt
principally upon the organ of Vision.
Its influence grant upon Animal
life is feeble compared with some of
the other stimuli to be mentioned hereafter, but
it has its proportion of force. Sleep as
I shall say hereafter is in one respect a tendency
to death, now ~~light~~ the Absence of

light we know invites to sleep, and
the restoration of it, produces a
tendency to life, or a waking state. Mr.
Rittenhouse informed me, that for
many years, he had constantly awoke
with the light, both in summer and
winter. Its influence on the animal
Spirits strongly demonstrates its
connection with the principle of life.
who has not felt his Spirits rise
& fall with the presence or absence,
of the sun, or even with the interposition
or passage of a cloud across his rays.
The celebrated M^r Stewart - one of
the greatest travellers in the world
informed me, that in one of his late
visits to our city, that he

V The influence of the rays of the sun upon certain diseases (as I shall say hereafter) is still more remarkable.

There are two facts upon the subject of light which I should not be omitted in this place. Fish putrify sooner in the west Indies when exposed to moonlight than when kept (in equal circumstances) in a dark place. & Dr Dr Rost informed me that oysters caught in N Carolina in y^e^ moon light nights never keep so long as those which were taken at other times. +

+ during the action of light they on steep that discharge y^e^ dephlogist. air.

we had spent three summer months
in Lapland in the latitude of 69° ~~at~~
during which time the sun was seldom
out of sight. - would ~~light nearly~~ en-
joyed he said
~~the~~ We felt during this period
an uncommon degree of health &
spirits, which he ascribed chiefly to
the constantly invigorating influence of light.
These facts will not surprise us when
we attend to the influence of light
upon vegetables. ~~Life~~. Some of them
lose their colour by ~~growing~~ being deprived
of light - and all of them - there a partiality
~~for~~ to it in the direction of their flowers
in those cases where the light would
not be supposed to have the least
mixture of heat. nor is this all. It is

2 Sound has an extensive influence upon human life. — Conversation is a ~~constant~~ fruitful source of Sound — but this is less constant than many others. The ~~sound~~ current of Winds — the passage of insects thro' the air — and even the growth of vegetables are all attended with an emission of sound, and tho' to us they have from habit become imperceptible, yet there are certain animals whose organs of hearing ~~to whom these~~ they strike with the force of thunder. — The existence of these sounds is evident from the reports of persons who have ascended ~~the~~ a mile or two ~~from~~ from the earth in Balloons. They

tell us that the silence in the upper regions of the air is awful. Let it not be urged here – that these sounds no sensations on the body or excite no perceptions in the mind. It is not necessary that this should be the case for them to produce motion in the ear, & thro' it, upon the whole system. There are an hundred impressions upon the body that from habit, are not attended with sensation, or consciousness. – The food we take, stimulates our stomachs – and the blood stimulates any in its circulation and moving fibres – and yet who in a healthy state ever felt a sensation or consciousness from either of them? It is possible every sound

I have mentioned, was one accomp^d: with Insensation & consciousness, and that both have been lost by habit in the same manner that we have lost both in the act of walking, for in this exercise, we are capable of Insensation & Consciousness from other things, and to assent to, as to pass considerable distances without any more knowledge of them, than we have of what passes in our sleep. It is unfortunate for this, & many other parts of physiological knowledge: that we forget what has passed in our first minds - the two or three first years of our lives. - I should could an infant of a year old

discovers to us, the manner in which
it acquired its first ideas, & the progress
of its knowledge with the evolution
of its faculties it would relieve us from a
number of difficulties & controversies
in upon this subject. — I suspect
however that much more than we
now know, might be extracted from
them if philosophers would now &
then visit a nursery and examine
the origin & progress of sensation, and
perception upon their bodies & minds
as discovered by their little & actions,
all of which probably have a
meaning as determined, as any of
the actions of men or women. —

The influence of sounds of a cer-
=tain kind in encreasing life, or produc-
=ing

a high degree of excitement will not be denied. — Fear produces debility, which is a tendency a death — now sound we know obviates this debility, and thus disposes to life. The school boy, and the clown whistle or sing as they pass by a country church yard — and the Soldiers fuls his life departing life exulted in the onset of a battle by the noise of the fife and of the Poets "Spirit stirring Drum". — Intoxication is a higher degree of life than is natural. — Now Sound we know will produce this with very moderate portions of liquor — hence we find men more easily intoxicated at public entertainments where there is music & loud talking — & hallowing,

V I shall dismiss this head by an observation which applies [illegible] to the stimulus of light as well as Sound, & that is that life is in a more languid state in persons who have lost their sight & hearing than in Others - hence their dullness and want of Spirits in company. + have an influence upon anim: life.

VI 3 Odors - Were the country where gently stimulating Odors abound is more healthy than cities. Milton was sensible of their effect on life - hence the following lines. ——— go on to p. 29 no 4

+ I wish the effect of Sound upon anim: :mal life to be remembered, for I shall mention it hereafter as a remedy for the weak state of life in certain Diseases, more particularly in the form of Music.

than in private companies where
there are so auxillary stimuli added
to the stimulus of the Wine. — V
The next external stimulus is N

6th Exercise. — This like thought is a reflected
Stimulus. the necessity of motion
to life is clearly indicated by the exercise
of keeping a garden
being imposed upon the first man
before, by the labor of cultivating the
earth being inflicted upon him after
his fall. — They both act first indirectly
upon the system this the medium
of the arterial system which by
enable to propel the blood — and 2ly they
act Directly on the nerves & brain. But
we are not to suppose that the
muscular fibres are moved
by exercise & labor alone. They are

constantly stimulated by the different
positions of the body, ~~all of~~ such
as ~~lying~~ standing - sitting - & lying on the
sides all of which require by action
of a certain numbers of muscles. —
go to p. 32

4 Heat is an active power in the
preservation of animal life. It is
external & internal. The Sun is the
source of external heat. The human
body by a power to be considered here
& in a way
- after furnishes the internal heat.
Nothing shows the necessity of heat
more upon human life, than the
decay ~~or extinction~~ of it which
takes place in its abstraction, or
under the influence of Cold. —

this is obvious in those animals
~~which sleepers~~ which become torpid
during the winter, and revive under
the invigorating influence of the sun.
It is true - the life in man suffers
less from the abstraction of heat,
but it is probably because the absence
of it is supplied by an increase in the
action of other stimuli. —

5 Pure air acts as a ~~up~~ stimulus
upon the System through the medium of the
Lungs. / The nature of this air will be
explained in the Lectures upon Chem. /
- I shall have occasion to speak of its
action when I treat of animal heat.
- I shall only ~~add~~ remark here that Dr Goodwin
ascribes the circulation of the ~~whole~~ blood

wholly to the absorption of this air in
the lungs, & its subsequent action ~~on~~ on
the heart. Does the external air
act upon any other part of y^r body
besides the lungs? — It is Probably it does,
and y^t we lose our sensation & Consci-
-ousness of it by habit. It is certain
children cry for the most part as
soon as they come into the world. May
not this be owing to the sudden dim-
-inution of this upon y^r tender surface
of y^r bodies? — and may not y^r red
color of y^r bodies be owing to an irritation
on the surface of the body excited by the
stimulus of the air? — It is certain
the air has a power of acting upon
animal fibres, — for who has not observed
a fool, or even the skin when denudated

v The action of air upon the alimentary
canal is also doubtfull. A portion of it
appears to be always present
in the bowels in the healthy state. It
is certain impure or morbid air acts
upon the stomach & bowels, hence the
sickness & vomitings we observe in them
in the first stage of contagious fevers.
return to p 28.

by the removal of the Cuticle to be greatly assisted by it.[2] V

we proceed next to consider the Internal Stimuli which produce or support animal life. — These are

1 Food. This acts in the following ways. 1 upon the tongue. The sensibility of this ~~1 in its mucous coat~~ organ is wonderfully connected with that of the whole system — hence we find the body invigorated by aliment as soon as it comes in contact with the tongue. ~~The British Officers feet~~. 2 by mastication. This excites a number of muscles variously situated near the brain & heart, & of course imparts a certain impetus to [illegible] 3 by Deglutition which likewise acts upon the vessels which convey blood to the brain. By 4 The

food which acts by its quantity & Quality
in the Stomach. By its quantity in
distending the Stomach & thus stimula-
-ting the adjoining irritable & vital
parts. — This distention is essential in
some measure to the excitement or
healthy state ~~tone~~ vitality of the System. It is produced
in men by Vegetables which afford but
little nourishment, or by Drinks. In
it is produced in
Horses ~~by~~ ~~in~~ mainly the same manner.
A horse will lose his strength
full away on Grain, Unless
he be fed at the same time with hay. 16 ℔. a
day are necessary to keep up y: distin-
-tion. — But food acts by its Quality.
a moderate Quantity of Aliment of
an acrid or stimulating nature sup-
-plies the place, of distention from
Quantity. — An Onion will support

a lounging Highlander on ye hills
of Scotland for four & twenty hours.
a moderate quantity of salted meat
or a few Ounces of Sugar have
supplied the want of pounds of less stimu=
^ =lating food. Even indigestible substances
which remain for days, or
perhaps weeks in the stomach exert
a stimulus there which has an in=
=fluence on animal life - It is in
this way, I suppose, the tops of briars
and the twigs of trees devoid wholly
of nourishing matter, but even
of Excellency or juices, support
the Camel in his journeys this the
Deserts of the Eastern Countries. The
chips of Cedar tho moistned with
water have supported horses for

two or three weeks, & the indigestable
woven of an old Bible once supported
a dog for 20 days. 5 Food stimulates
by the products of digestion. I hope to prove
hereafter that this Animal process is
carried on fermentation in ye human
Stomach. _ Now in the act of ferm.n
there is an extrication of
heat & air both of which we
know are of a stimulating nature.

Drinks when they consist of fermented
or distilled liquors stimulate from
their quality - but when they consist of waters,
or of mild impregnations of water they
act only by Distention. —

2 The Chyle acts upon ye lacteals -
mesenteric glands & thoracic Duct in
its passage thro them, and it is probable

that its first mixture with the blood
in the subclavian Vein, & its first
action on the heart may be attended
with peculiar stimulating effects. —

3 The Blood is the next internal stimulus.
It has been disputed whether it acts by
its quality, or only from distention. If
we admit the Doctrine of Specific Stimuli,
the ~~difficulty~~ question is solved at once. For my
part I see no more difficulty in admitting
y^t the blood may posess a power of stimulating
ting the heart & arteries, & no other
part of the body, than that light shd
exclusively stimulate the retina, or
dephlogisticated air, the lungs. But if this
be denied, the Stimulus of distention
will account for a very extensive
stimul^g action of blood upon y^e System.

Is The effects of this stimulus appear
in the assistance of the female con-
= stitution during pregnancy, to all
the causes of death. It is sometimes so
great as to prevent Sleep altogether for
several weeks before delivery. How seldom
do we hear of death in pregnant women
even from the most malignant fever.
— Even the plague itself is arrested in
its progress towards the destruction of the
body by pregnancy. — Even in this,

It pervades every part of the body by means of blood vessels - and an uncommon portion of its Stimulus is spent upon the heart & brain. It is remarkable that the blood is not lodged in large vessels in those who die of hunger: & a certain tension of the glands and of other parts of the body con= =tributes to support animal life. This is evident in the fulness of the alimentary canal & of the animal Vesicles in males, and in the distention of the Uterus in female Subjects. They both increase the quantity or degree of life, and the faintness which follows child birth is a tendency to death, & this is the consequence of the Abstraction of the Stimulus of distention. In Animals which die of hunger - the Gall bladder is found fill with bile - Probably this may be a provision of nature to contract by the Stimulus of distention

as well as in other malignant fevers,
natural
delivery, or abortion always precedes
death.

V Before I proceed to speak of the influence
of each of the faculties of the mind upon animal
life it will be necessary to premise, that
they act by reflection only on the body, ie
they are always first excited into action
by impressions upon the body, which have been mentioned,
they react upon the body. This should sup-
pose us no more than the actions of the
body upon matters that are external to it;
for these are previously excited by impressions
upon the different senses. I am aware
that this passive view of the mind is
not a popular one, with orthodox
Physicians or Divines - but the objections
to it are founded in prejudice by the
former, & in a mistaken zeal for a

the tendency to death which arises from the abstraction of the stimulus of aliment.

5th The exercise of the Understanding & of the passions is a powerful stimulus, & acts with considerable force in supporting animal life. — Of the influence of Pulzke ✓ Of the Understanding.

Thinking belongs to this power of the mind. Now thinking is a stimulus. — It promotes circulation — Secretion — and even quickens the pulse. When used in moderation it not only supports, but adds to the duration of human life. Hence the longevity of men of great & active Understandings. Idiots are seldom long lived. The Cretins in Valais in Switzerland a race of idiots, all die young. Common language justifies the opinion of the stimulus of the

Travellers tell us

10:38

Where most mind - most capacity of life - & longevity. Indians seldom so long lived as civilized people - literary men certainly long lived. ——

+ The impetus of a new thought coming suddenly on the mind has in one instance that came within my knowledge been so great, as to produce a temporary Giddiness of the head.

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a Speculative Opinion in religion by the ~~Other~~ latter Class of men. This ~~In~~ tends to ~~lower of religion~~, I hope will soon appear on our Side of the Question) Opinion is - that if we admit the mind to be wholly Passive, and altogether dependant on the impressions received thro the body for all its the exquisite of wonderful powers, and numerous Operations, it will follow that the Soul can exist only in a State of Connection with the body, and that ~~if~~ Cause the Soul must remain to ~~exist~~ do. it. ~~the body~~ in ~~a state~~ a torpid state ~~it~~

Understanding on the Brain - for we say of dull men "that they have hardly Sense enough to keep them awake." + By 2 The stimulus of the Passions is less equivocal, because more Blameable. - They are Passions properly so called & Emotions ~~Appetites~~ divided into ~~two as are good and~~ ~~vitia~~ ~~Vices~~ ~~Vices~~ The Passions ~~which have~~ ~~good~~ for their Objects ~~are those~~ ~~or Vices~~ Ambition,

The Passions are attended with desire or aversion, & known & have for their Objects distant good or evil. ~~The~~ Emotions are without

see p. 19.

desire, and arise from present good or evil. Propensities are desires of a distant, but unknown Good. These Passions & Emotions - ~~are those~~ are either stimulating or sedative. Our business at present is only to take notice

between the death & resurrection of the
I shall not decide upon this question not only but
body. Those who urge this Argument-li-
=ke shall briefly mention the arg^ts for & ag^t it. ^
=mit the operations of divine powers, but
they discover an ignorance of many ana-
=logies in nature, & particularly in the
Animal Oeconomy, which may serve
to shew that the argument has no force.
~~It is easy to conceive that of absolute~~ X It
~~fully believe in a Separate State of ex-~~ ~~Separate State~~
~~is easy to conceive~~ that a new vehicle of
impressions may be ~~communicated~~ given to the soul
soon as it leaves the body, or that such
substitutes for a body may take place,
as we observe to take place in the body,
when it is deprived of any of its custo-
=mary Avenues of impression. E.g. Law
Boerhaave the nephew of the celebrated
Dr Boerhaave, who lost his hearing - but

of those which are Stimulating.
They are hope - love - lust - Ambition - the
moral powers of conscience & moral faculty;
envy - malice - and Avarice. The
Emotions are joy & anger - Fear &c -
~~= Vices are a deviation of the passions~~
~~unbalanced state~~ In the original
Constitution of human nature ~~was~~
the body
was made to be stimulated only by
the passions and emotions which
have moral good for their Objict.
we were
~~He was~~ made always to hope
always always
— to love & to be joyful. But mod-
ern
-chally experience teaches us that this
at the coal.
is not the present Character of human.
the Supreme Creator
But God cannot be disappointed
in any of his works by man;

this sense was dispersed by his whole
body being converted into an organ of
hearing. This the medium
By means of his feet, he could
tell when any thing fell on the floor, &
this the medium of
by putting his hand on the shoulder of a
person when speaking, he could tell every
word he said. — Several Other instances
of a translation of the senses to foreign
parts of the body have been mentioned. Lastly
= Lastly. Again - certain vegetables require earth
- water - & air for their growth - but it is
well known that the same vegetables will
grow in water without earth - & others of
them - in air without water - These facts
it is said
make it probable that the Soul may exist
and receive impressions in a seperate
state from the body. Its pleasures & its
pains in this state, must necessarily
be imperfect, & hence the necessity of

He has therefore 41 kindly wisely connected
~~It belongs to Him to extract evil~~
~~from good, but God has extracted~~
~~good out of evil, and by connecting~~
a stimulus with evil passions, &
emotions, & thus has rendered them
subservient to the purposes of pro-
-moting Animal life; hence anger-
malice - Ambition - Avarice - and
lust supply in a certain degree the
place of Love - Darwin's Zoot - Or
Hartley's Association - Love & joy. It
is true they are like the stimulus
of a dislocated bone, compared
with the gentle action of Antago-
-nist muscles stretched over bones
and gently moving in their natural
sockets, ~~Boots~~ or like the stimulus

p: 41

A decay of the eye sight in old age is
the beginning of death. Spectacles
furnish a new medium for the
transmission of light to the eyes by
which depositing life & light are re-
stored to them. In like a manner,
may not new mediums of sensation
& life be imparted to the soul as soon
as it is seperated from the body &

they say
its reunion with the body, at the resurrection
- In speaking of the pleasures & pains of the
Soul in a seperate State of existence, I
confine myself only to those pleasures and
pains, ~~it took~~ which are derived from
impressions made on the body, for such of
them as are excited ~~by the Actions of the~~ by consciousness
~~divine Spirit~~ upon the Mind are probably
as perfect in its seperate State as they are
in ~~the~~ its connection with the body ~~for~~ for
this Spirit acts upon the Mind without the instrumen-
tality of bodily impression, even while it is
~~upon the Mind~~
connected with the body. I I return now to
speak of the ~~in~~ reflected action of the several
faculties of the mind upon animal life.
In support of the last
~~In favour of~~ In ~~Opposition to this~~
Opinion
~~Doctrine of a Seperate State of existence~~,
it is said, ^ That the Soul & body were

the stimulus of
Of ardent Spirits compared with
that of milk
Vegetable, and vegetable aliment. The
Influence of the Understanding and
of the passions upon human life has
been ascertained by many Observa-
=tions. — Studious men who have
all
not neglected the means of health
have generally been long lived. Witc
=ness Newton — Franklin — Wesley —
Rollin — and a hundred others whose bodies
for more than half a Century
were constantly under the stimulus
of active & vigorous Understandings.
The influence of the good passions
in prolonging
& emotions upon Animal life
has likewise been established by

both included in the Sentence denounced
ag't man after his fall. Viz: "Dust thou
art & unto Dust shalt thou return". The
Divine Veracity, makes the Death of the Body necessary.
2 That the demerit of Sin appears more
conspicuous in the death of the Soul
as well as the body, more especially as
the Soul ~~was~~ reduced the body, and
was of Course the first & greatest trans:
=gressor. 3 It is said the Merit of perfection
the Christian System is more illus=
=triously displayed by the Doctrine of
the death of the Soul; for it shows greater
power of to reanimate a dead, Soul
than a dead body at the general Resur=
=rection which is predicted & promised
in the Gospel. 4 turn over 5 It is said that the
time which is payed in the grave is
no longer than that which is required

many facts. Hope love & joy are
like oil perfumed with frankincense
to the lamps of life. ~~Where will~~
~~find many others~~ nor are there
wanting instances of persons who
have attained to uncommon old
age, who have been subject to more
or less of all the evil passions, and
emotions I have mentioned. Ben:
Long who died above 80 was subject to
anger - Elves to a remarkable degree. It may
exist in Europe furnishes examples
of men who have lived to be very
old, who have been constantly
under the dominion of Ambition.
In the course of a long inquiry into

to take place between Death, & the entrance of a Soul into a seperate state of existence. all consciousness of time being as much lost after death, as in profound sleep. who can tell when he wakes in the night, ~~but~~ or in a dark room in a morning, whether he has slept ~~but~~ a minute, an hour, or six or seven hours? —

It is said that the death threatened upon Adam was simply annihilation, & that this would have been the fate of all his posterity, had not the gospel ~~dispensation~~ revealed the future by holding forth the promise of the Resurrection which strictly speaking brings ~~life~~ ~~Light~~ life & immortality to light, by shewing that we are to

the history of old age, I did not find
one person who had lived to be 80 who
was ~~made the~~ not a person of an ac-
-tive understanding or of active passions.
Take notice here that to be salutary,
they should be exercised moderately. In
our Pathology I shall mention many
diseases, & even some sudden & early
deaths brot on by the intemperate
exercise of the understanding & passions.
- I ~~must~~ dare only to add to this
head, that I can by no means admit
with Dr Brown the ~~influence~~ stimulus of
~~the action of~~ on
all, of any
one of these powers of the mind, to
be so essential to life as to act in
sleep. On the contrary, I believe

live again. This view of the subject is
I acknowledge
comfortable, for as it leves the whole
human race to be interested in the
benefits of the resurrection, it proves
that they will ultimately be interested
in all the other blessings of the gospel.

6 In answer to those passages in the
Old &
New testaments which speak of a
seperate state of existance, they say that
the sacred historians, prophets & apostles
were inspired with Divine, but not
with metaphysical knowledge, & that
it is no more wonderful that they
should be mistaken on that point,
than they should be carried away by
the common, & erroneous notion of
the sun's rising & setting & standing still.
Go to pa 47.

the Soul to sleep ~~in perfect~~ with the
body in perfect health. It is true
they all act in Dreams - ~~so~~ in which
case they are certainly stimulating,
but Dreams are a disease, & do
not belong to our present inquiries,
for I am considering the body now only in
a healthy state. - Dreams like
the a full gall bladder ~~in~~ which attends
an empty stomach, serve only to
want
supply the ~~place~~ of some natural
stimulus. Hunger
~~The~~ idle who neglect the
stimulus of labor, or the luxurious
who bring on indirect debility by
excess in eating or drinking are
most subject to ~~them~~ Dreaming, and perhaps.

In answer to this opinion, & in favor of an immaterial or material principle existing in a separate state — go to p: 40 ✕

✕ To the effects of the passions upon animal life, I shall only add that the much has been ascribed to the influence of the will upon animal life, but as this faculty of the mind acts thro' the medium of the passions, it will not be necessary to add any thing further upon it.

In what ever manner this controversy may be decided, I shall maintain the mind to be first passive before it becomes active, & that all its operations are as much the effects of internal & external sensation as the sound of a Bell is the effect of the stroke of a hammer.

But more of this hereafter.

this may be the final cause of
Dreams. — I shall I hope presently
more fully refute the necessity of admitting
Dr Brown's idea of the soul's thinking
in Sleep. It will serve to illustrate
the principles I have endeavoured to
establish, to take notice of a Symptom
in acute diseases from which even
Nurses & old women augur a re=
=covery. — I mean a person changing
suddenly from that pensive & tran=
=quil State of mind which attends the
Disease
lowest Stage of acute, & suddenly
becoming peevish & ill natured. The pre=
=vious Sleep is a gentle Stimulus to the
System; & often assists in bringing on a
Crisis of the disease. ——

47 Dr Fenwick & Others

7 It is said that by Dr Haller that intelli-
-gence has appeared in many persons
who have lost a large portion of their
brains. This is probable may probably
depend upon a translation of the seat
of thought - such as occurs in the
translation of the seat of the senses
formerly mentioned.

8 It is said that the mind continues
perfect & vigorous in old age & in the
hour of death when the body exhibits
every mark of decay & dissolution. The
same thing often occurs in the stomach,
& yet no One has said upon that act
that it is immortal, & that it will exist
in a state of separation from the body.
The vigor of the mind in old age, & just before death, depend
alike upon those parts being the

last retreats of dying excitement.

Should it be true that thought
is ~~one~~ mere effect like animal life of
impression differing from it only in
being confined to the brain; it should
~~be~~ not dispose us more than
~~the~~ the production of speech by the
numerous motions of the glottis, tongue
& lips. ~~It would be~~ The idea ~~is~~ so
far from being unfriendly to ~~the~~
just conceptions of the divine Being, exalts
his wisdom & power in my opinion
infinitely more than the creation of
ten thousand worlds of matter devoid
of intelligence. & motion & See to p: 407-O

V Q many of our mental pleasures & pains are seated
in different parts of the body - Eg the heart is the
seat of joy & grief - now we cannot suppose
the soul to occupy both the heart & brain.